HST INS Work Item Data Sheet

1. SI/Title: Telescopes/Aberrations & PSF Impacts on Science

2. INS Lead: M. Lallo

3. Description of Work:
   Track and analyze coma and astigmatism values from prop 10752. Investigate dependencies. Analyze aberrations from proposal 9017 (ACS SMOV), which provided a bright isolated PSF in HRC over 8 orbits ranging from a hot to cold attitude, and write a report. Identify and advertise relationships between measured or modeled Zernike variations and PSF characteristics in science data. Report at 2006 SPIE conference. Determine A-->f(SMpos) where A is amplitude scale factor in breathing model relating Light Shield temperatures to FWHM in HRC pixels. Correlate CCS temperatures at ACS with annual periodicity in observed astigmatism.

4. Schedule Constraints and Dependencies:
   Two papers will be presented at the SPIE meeting in late May

5. Risks and Open Issues:
   Risk – Analysis of telemetered temperature data may exceed available resources.

   Risk – Personnel optical expertise may limit the effectiveness of the characterization.

   Risk – The resulting science benefit may be small; this will be better known by the end of FY06.

6. Priority: High

7. Priority Justification:
   ACS PSF morphology is important to certain types of science being done with the instrument (e.g., weak lensing), and this work will improve this science. The knowledge gained from this investigation will be applicable to future mission design, in order to help avoid the same types of PSF effects. Finally, the group has committed to the SPIE papers, which has a firm deadline.

8. Resources (including estimated calendar duration for each portion):
   a. Development
      M. Lallo (0.13 FTE)
      R. Makidon (0.08 FTE)
      S. Casertano (0.07 FTE)
      T. Wheeler (0.04 FTE)

9. Documentation and Deliverables:
   Two SPIE papers
   ISRs
   ACS and Observatory Web Page Updates